

## **AMENDMENTS**

### **In the Claims**

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### **New Claims**

1     45.(new)     A method for noninvasive analysis of blood comprising the steps of:  
2             irradiating blood in a big vein associated with an underside of a patient's tongue with  
3     radiation having at least one frequency or wavelength;  
4             detecting a response from the blood irradiated in the irradiating step;  
5             calculating a concentration of a blood component, a value of a blood parameter or a mixture  
6     or combination thereof from the response.

1     46.(new)     The method of claim 45, further comprising the step of:  
2             displaying the response, the concentration and/or the value from the calculating step.

1     47.(new)     The method of claim 45, wherein the detecting step comprises the step of:  
2             utilizing one or a combination of techniques selected from the group consisting of reflectance

3 technique, confocal technique, scanning confocal technique, polarization techniques, interferometry,  
4 optoacoustics, low coherence interferometry and reflectometry, techniques based on speckle  
5 measurements, fluorescence technique, Raman scattering technique, and two or multi-photon  
6 techniques.

1 48.(new) The method of claim 45, wherein the wavelength of the radiation is from about 200  
2 nanometers to about 20 microns.

1 49.(new) The method of claim 45, wherein the radiation has a single wavelength or frequency  
2 or a plurality of wavelengths or frequencies.

1 50.(new) The method of claim 45, wherein the response corresponds to a concentration of  
2 hemoglobin in the blood and the wavelength of the radiation is selected from the group consisting  
3 of 548 nm, 568 nm, 587 nm, and 805 nm, from about 400 nm to about 640 nm and above about 1120  
4 nm.

1 51.(new) The method of claim 45, wherein the blood component is selected from the group  
2 consisting of hematocrit, hemoglobin, glycosylated hemoglobin, hemoglobin and glycosylated  
3 hemoglobin, glucose, cholesterol, oxy-hemoglobin, deoxy-hemoglobin, and carboxy-hemoglobin,  
4 and an exogenous substance.

1 52.(new) The method of claim 51, wherein the exogenous substance is selected from the group  
2 consisting of a drug, a dye or other reporter in a molecular state or a particle made of a liquid, a gas,  
3 or a solid, a combination of a liquid, a gas, or a solid, and a layered structure.

1 53.(new) The method of claim 51, wherein the exogenous substance is selected from the group  
2 consisting of indocyanine green and Evans blue.

1 54.(new) The method of claim 52, wherein the exogenous substance are particles having a size  
2 from about 0.1 nanometer to about 10 microns.

1 55.(new) The method of claim 45, wherein the radiation is selected from the group consisting  
2 of microwave radiation, radiofrequency radiation, ultrasound radiation, and low-frequency  
3 electromagnetic radiation.

1 56.(new) The method of claim 45, further comprising:  
2 performing the detecting step in the presence of a static electric or magnetic field.

1 57.(new) An apparatus for noninvasive blood analysis comprising:  
2 a probe including a tip having a radiation outlet and a response inlet, where the probe tip is  
3 adapted to be placed in proximity to or in contact with a surface of a tissue over a big vein associated  
4 with an underside of a patient's tongue;  
5 a light generation/delivery system including a light source capable of generating at least one  
6 frequency of light, and a light conduit interconnecting the light source with the radiation outlet,  
7 where the system is adapted to deliver radiation to blood in the big vein; and  
8 a detector/analyzer system including a detector adapted to detect a response from the  
9 irradiated blood via the response inlet and an analyzer adapted to convert the detected response into  
10 a concentration of a blood component and/or a value of a parameter of the blood.

1 58.(new) The apparatus of claim 57, further comprising:  
2 a display adapted to display the response, the concentration, and/or the value.

1 59.(new) The apparatus of claim 57, wherein the wavelength of the radiation is from about 200  
2 nanometers to about 20 microns.

59.(new) The apparatus of claim 57, wherein the radiation has a single wavelength or frequency  
or a plurality of wavelengths or frequencies.

1 60.(new) The apparatus of claim 57, wherein the detector is capable of detecting data derived  
2 from one or a combination of techniques selected from the group consisting of reflectance technique,  
3 confocal technique, scanning confocal technique, polarization techniques, interferometry,  
4 optoacoustics, low coherence interferometry and reflectometry, techniques based on speckle

5 measurements, fluorescence technique, Raman scattering technique, and two or multi-photon  
6 techniques.

1 61.(new) The apparatus of claim 57, wherein the response corresponds to hemoglobin and the  
2 wavelength is selected from the group consisting of 548 nm, 568 nm, 587 nm, 805 nm, from about  
3 400 nm to about 640 nm and above about 1120 nm.

1 62.(new) The apparatus of claim 57, wherein the blood component is selected from the group  
2 consisting of hematocrit, hemoglobin, glycosylated hemoglobin, hemoglobin and glycosylated  
3 hemoglobin, glucose, cholesterol, oxy-hemoglobin, deoxy-hemoglobin, and carboxy-hemoglobin,  
4 and an exogenous substance.

1 63.(new) The apparatus of claim 62, wherein the exogenous substance is selected from the  
2 group consisting of a drug, a dye or other reporter in molecular state or a particle made of liquid, gas,  
3 or solid material including polymer, metal, semiconductor, dielectric, or a combination of liquid, gas,  
4 or solid materials, and a layered structure.

1 64.(new) The apparatus of claim 62, wherein the exogenous substance is selected from the  
2 group consisting of indocyanine green and Evans blue.

1 65.(new) The apparatus of claim 63, wherein the exogenous substance are particles having a  
2 size from about 0.1 nanometer to about 10 microns.

1 66.(new) The apparatus of claim 57, wherein the radiation is selected from the group consisting  
2 of microwave radiation, radiofrequency radiation, ultrasound radiation, and low-frequency  
3 electromagnetic radiation.

1 67.(new) The apparatus of claim 57, further comprising:  
2 a device for generating a static electric or magnetic field.

1 68.(new) An apparatus for noninvasive blood analysis comprising:

2 right side and left side sections adapted to engage one or more teeth on each of a right side  
3 and left side of a patient's jaw,  
4 two transitions section extending downwardly from each of the side sections,  
5 a middle section interposed between the two transitions sections adapted to be proximate to  
6 or in contact with an underside of a patient's tongue, where the middle section includes;  
7 a emitter, and  
8 a receiver,  
9 where the emitter and the receiver are proximate or in contact with a surface of a  
10 tissue over a big vein associated with an underside of the patient's tongue;  
11 a light generation/delivery system including a light source capable of generating at least one  
12 frequency of light, and a light conduit interconnecting the light source with the radiation outlet,  
13 where the system is adapted to deliver radiation to blood in the big vein; and  
14 a detector/analyzer system including a detector adapted to detect a response from the  
15 irradiated blood via the response inlet and an analyzer adapted to convert the detected response into  
16 a concentration of a blood component and/or a value of a parameter of the blood.

1 69.(new) The apparatus of claim 59, further comprising:  
2 a plurality of emitters and receivers, located in pairs on a right hand side and a left side of the  
3 middle section.

1 70.(new) The apparatus of claim 68, further comprising:  
2 a display adapted to display the response, the concentration, and/or the value.

1 71.(new) The apparatus of claim 68, wherein the wavelength of the radiation is from about 200  
2 nanometers to about 20 microns.

71.(new) The apparatus of claim 68, wherein the radiation has a single wavelength or frequency  
or a plurality of wavelengths or frequencies.

1 72.(new) The apparatus of claim 68, wherein the detector is capable of detecting data derived  
2 from one or a combination of techniques selected from the group consisting of reflectance technique,

3 confocal technique, scanning confocal technique, polarization techniques, interferometry,  
4 optoacoustics, low coherence interferometry and reflectometry, techniques based on speckle  
5 measurements, fluorescence technique, Raman scattering technique, and two or multi-photon  
6 techniques.

1 73.(new) The apparatus of claim 68, wherein the response corresponds to hemoglobin and the  
2 wavelength is selected from the group consisting of 548 nm, 568 nm, 587 nm, 805 nm, from about  
3 400 nm to about 640 nm and above about 1120 nm.

1 74.(new) The apparatus of claim 68, wherein the blood component is selected from the group  
2 consisting of hematocrit, hemoglobin, glycosylated hemoglobin, hemoglobin and glycosylated  
3 hemoglobin, glucose, cholesterol, oxy-hemoglobin, deoxy-hemoglobin, and carboxy-hemoglobin,  
4 and an exogenous substance.

1 75.(new) The apparatus of claim 74, wherein the exogenous substance is selected from the  
2 group consisting of a drug, a dye or other reporter in molecular state or a particle made of liquid, gas,  
3 or solid material including polymer, metal, semiconductor, dielectric, or a combination of liquid, gas,  
4 or solid materials, and a layered structure.

1 76.(new) The apparatus of claim 74, wherein the exogenous substance is selected from the  
2 group consisting of indocyanine green and Evans blue.

1 77.(new) The apparatus of claim 75, wherein the exogenous substance are particles having a  
2 size from about 0.1 nanometer to about 10 microns.

1 78.(new) The apparatus of claim 68, wherein the radiation is selected from the group consisting  
2 of microwave radiation, radiofrequency radiation, ultrasound radiation, and low-frequency  
3 electromagnetic radiation.

1 79.(new) The apparatus of claim 68, further comprising:  
2 a device for generating a static electric or magnetic field.

